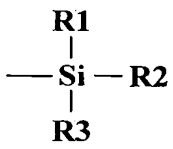
WHAT IS CLAIMED IS:

1. A proton conduction material comprising:

a polymer material which has a molecular structure having a main chain and a side chain grafted on the main chain and at least partially including an end structure expressed by a formula shown below, and which has a strong acid functional group in the molecular structure,

the formula being



where R1, R2 and R3 are independent of one another and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

2. The proton conduction material according to claim 1, wherein

R1, R2 and R3 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

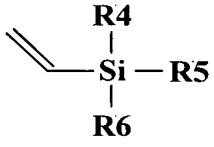
3. The proton conduction material according to claim 1, wherein

the strong acid functional group is a sulfonic acid functional group.

4. A proton conduction material comprising:

a polymer of a mixture which contains a monomer having a vinyl radical and a monomer expressed by a formula shown below and whose molecular structure has a strong acid functional group,

the formula being



where R4, R5 and R6 are independent of one another and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

5. The proton conduction material according to claim 4, wherein

R4, R5 and R6 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

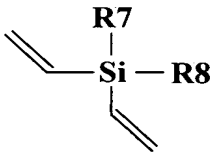
6. The proton conduction material according to claim 4, wherein

the strong acid functional group is a sulfonic acid functional group.

7. The proton conduction material according to claim 4, further comprising:

a monomer expressed by a formula shown below,

the formula being



where R7 and R8 are independent of each other and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

8. The proton conduction material according to claim 7, wherein

R7 and R8 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

9. The proton conduction material according to claim 4, wherein

the monomer having the vinyl radical contains styrene, and

the strong acid functional group is introduced into a phenyl radical originating from the styrene.

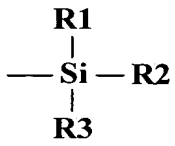
10. The proton conduction material according to claim 4, wherein

the monomer is vinyl triethylsilane, vinyl tris (trimethylsiloxy) silane, and/or vinyl-t-butyldimethylsilane.

11. A method of manufacturing a proton conduction material, comprising the steps of:

grafting a side chain on a main chain such that a molecular structure at least partially including an end structure expressed by a formula shown below is obtained,

introducing a strong acid functional group into the molecular structure, the formula being



where R1, R2 and R3 are independent of one another and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

12. The method according to claim 11, wherein

R1, R2 and R3 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

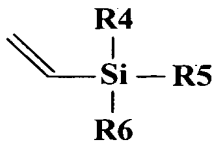
13. The method according to claim 11, wherein

the strong acid functional group is a sulfonic acid functional group.

14. A method of manufacturing a proton conduction material, comprising the step of:

introducing a strong acid functional group into a molecular structure containing a monomer having a vinyl radical and a monomer expressed by a formula shown below,

the formula being



where R4, R5 and R6 are independent of one another and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

15. The method according to claim 14, wherein

R4, R5 and R6 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

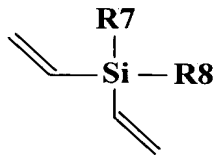
16. The method according to claim 14, wherein

the strong acid functional group is a sulfonic acid functional group.

17. The method according to claim 14, further comprising the step of:

introducing a monomer expressed by a formula shown below,

the formula being



where R7 and R8 are independent of each other and represent a hydrocarbon radical, a fluoro-substituted hydrocarbon radical, or a trimethylsiloxy radical.

18. The method according to claim 17, wherein

R7 and R8 in the formula are selected from a methyl radical, an ethyl radical, a propyl radical, a t-butyl radical, a phenyl radical, a trimethylsiloxy radical, a trifluoromethyl radical, and a pentafluorophenyl radical.

19. The method according to claim 14, wherein

the monomer having the vinyl radical contains styrene, and

the strong acid functional group is introduced into a phenyl radical originating from the styrene.

20. The method according to claim 14, wherein

the monomer is vinyl triethylsilane, vinyl tris silane, and/or vinyl-t-butyldimethylsilane.